

**Corps of Engineers AFEP Fish Facility Design Review Work Group  
Portland District  
December 7, 1999, Summit Conference Room, 9:00a.m.**

**ACTION ITEMS FROM The September 28, 1999 MEETING**

**DISCUSSION TOPICS**

1. B2 FGE: Scope for 2000 Clarke/Langeslay
2. B1 PSC bio-test Scope: Ebberts/Clarke
3. TDA Surface Collection (Blocked trash rack): Tolonen/Sedey/Shutters
4. JDA Spill Test 2000: Stanger/Shutters
5. JDA Surface Collection and spillway weir: Hanson
6. John Day ESBS: Stanger/Hanson/Langeslay

**UPDATES:**

System Studies:

1. Gas Fast Track: Emmert/Peters
2. Gas abatement program: Emmert/Peters
3. Turbine survival program: Bird/Schwartz
4. Turbine working group update: Rod Wittinger
5. Adult Lamprey: Langeslay

Construction:

1. B2 outfall and DSM: Chun/Ebberts
2. B1 turbine rehab: Mettler/Schwartz

Bonneville:

1. Bonneville Adult Pit: Ebberts
2. Bonneville 1 FGE: Lee
3. Bonneville 1 JBS Improvements and trash handling: Dewey
4. Physical Guidance Forebay Device: Etzel
5. Bonneville 2 AWS Backup: Maurseth/Shutters
6. B2 Debris Study: Bird/Shutters
7. B2 High Flow Outfall: Etzel/Ebberts

John Day:

1. John Day Drawdown: Stanger/Ferguson
2. JDA Spill End Bay Deflectors: Hanson
3. John Day Configuration: Jerry Christensen/Langeslay

The Dalles:

1. TDA Adult Ladder Modifications: Tolonen/Russel
2. The Dalles Combined System: (outfall relocation) Sedey/Bird
3. TDA Survival Test: Shutters/Peters
4. TDA debris shear boom: Tolonen
5. TDA rehab: Tolonen/Schwartz

Others:

CENWP-EC-E (1146)

MEMORANDUM FOR THE RECORD

December 20, 1999

SUBJECT: Minutes from the Corps of Engineers Anadromous Fish Evaluation Program, Fish Facility Design Review Work Group (FFDRWG) Meeting, held on December 7, 1999. **Note: FFDRWG meeting minutes can also be found by accessing the Environmental Resource Branch Web Page at <http://www.nwp.usace.army.mil/pm/e/ENFISH.htm> .**

The meeting was attended by the following individuals:

**ACTION ITEMS FROM THE LAST MEETING:**

1. Bonneville 1 Decision Process – We sent out a draft M&E plan to the region and asked members if there was a need for a special SRWG. Only NMFS has responded. No date has been set.
2. Gas – We sent out meeting minutes from September 23/24.
3. Turbine Survival – We coordinated an inspection of the release pipes.
4. John Day ESBS – We held a NWP/NWW joint meeting to discuss debris issues. **Mike will send minutes from this meeting to FFDRWG members.**
5. John Day Dam Surface Collection – Cost estimate is done.

**DISCUSSION TOPICS:**

1. Bonneville Powerhouse 2 FGE – Doug Clarke handed out and summarized what he would present at the upcoming SCT meeting (see attached handout). We are proposing a phased approach that initially focuses within the intake. We will field test a prototype in 2001 or 2002, depending on whether modeling and fish behavior work in 2000 point us to screen modifications as well as gatewell. A key issue in our modeling program is determining the nature and effects of cross flow. Rock asked the group what their views of the program are. All responded positively, except CRITFC, which said they were not excited, but would not stand in the way. Mike L. handed out special FFDRWG meeting minutes.
2. Bonneville Powerhouse 1 Prototype Surface Collector Biological Testing – Draft proposals for FY00 biological testing are out for regional review. **A meeting to update SRWG members on the FY00 testing program is scheduled for 7 January. Blaine will send out an agenda prior to that date.**
3. John Day Surface Collection – Matt handed out a memorandum on surface collection alternatives. Comments are due December 23. He also passed out an alternatives analysis table that compares a 2001 to a 2002 schedule. The FY02 schedule gives us an opportunity to evaluate the effect of extended end bay flow deflectors on fish survival and injury. All agreed that the 2002 schedule provided a reasonable time frame for testing the raised crest.
4. The Dalles Surface Collection – Lori handed out a trip report from a recent WES visit. They looked at the 'J' and 'L' configurations, with and without gaps. The 'J' and 'L' performed similarly except in the near field, where the 'J' performed better (the 'L' created localized diving effects). Because the 1:80 model was down for modifications, they could not calibrate at 40% spill, so they gave it their best guess for that particular condition. Marvin added that the first thing to look at during the upcoming agency WES trip is calibrated 40% spill. Steve Rainey asked if we could do a design to block gaps. Marvin said we couldn't do this in time for a 2001

- test, but could initiate work on this now. Marvin discussed deployment of the blocks for FY00 biological testing. We want to get similar environmental conditions (flow, temperature, etc.) between treatments, but the trash rack blocks take 4 days to remove or deploy. We are working to reduce this time to 1 day. Options include: 1.) move horizontal part on a night shift, 2.) leave horizontal part in but fold lip down, 3.) design lifting beam that will pick the horizontal part, 4.) wait until 2001 to test, when we can get a hoist on each of the horizontal panels.
5. John Day ESBS – We are considering bar screen as an alternative to the plastic mesh used on VBS panels. The reason is that bar screen would require less maintenance, and could be cleaned with an automatic sweep. The need to evaluate bar screen versus plastic mesh was discussed. NMFS felt that bar screen should not be a problem in terms of fish safety, and therefore comparing its performance to plastic mesh would not be necessary. We do not have the sweep mechanism designed, so it was difficult to determine if there would be a debris handling benefit of a bar screen VBS. The group asked that, until we have a design, we keep our options open, but that bar screens would get a favorable response.
  6. John Day 24 Hour Spill Test – We evaluated the benefits of daytime spill on juvenile passage at John Day in 1999. Because of flows, we were unable to get all of our blocks of 0% daytime spill. The long-range flow forecast is predicting a high water year in 2000, so there is some likelihood that another year of testing may be compromised by forced spill. We asked the group if it was worthwhile doing a spill test in 2000, or did it make sense to wait until 2001, when there may be lower flows and some potential savings due to concurrent studies (e.g. hydroacoustic FGE). Some members thought that it made sense to plan for a 2000 FPE and survival test, then allow for a radio telemetry survival element to remain if it looks like we can't get our study blocks for FPE. Ron Boyce said he did not see the management application for survival information. **We will hold a separate meeting to discuss the study details on 14 January.**

## UPDATES:

### System Studies

1. Gas Fast Track – The Bonneville model is complete. Dennis Schwartz will be biologist lead doing all the engineering design documents (EDD). The modeling element goes through May. We are continuing to move out on EDDs for LMO, MCN, and BON. Also discussed the John Day near field spill test. On schedule for testing in January.
2. Gas Abatement – We had our last meeting on November 8 and the minutes for this have gone out to the region. We have selected two independent reviewers (John Gulliver and Dr. Shadrey) for the numerical model. We are hosting a workshop on the 15<sup>th</sup> and 16<sup>th</sup> of December in Richmond, WA. The purpose of the meeting is to bring the reviewers up to speed on the program.
3. Turbine Survival Program – We are through our first test block, which consisted of 12 days with 4 scenarios. For Unit 5 hub release we had high 24 and 48 hour delayed mortality in both the test and control fish. We believe this was due to high dissolved gas supersaturation, and high turbidity in the holding tank. Dennis provided the group with some preliminary survival estimates. He said that since our recapture rate on control fish is high, we will reallocate some control fish to where they are most needed in future releases. Tom Lorz asked if we were doing microscopic internal exams for injury. Dennis said that we were examining mortalities for gross internal injury, but not using a microscope. Gary Fredricks asked if how our analysis deals with fish not recaptured. Dennis said that radio signals lost before the fish exits, are excluded from the analysis. Radio signals that exhibit predator behavior are counted as mortalities.

## Construction

1. Bonneville Powerhouse 2 Outfall – There was a recent site visit to look for follow-on needs. Pipe/flume transitions at the PIT tag coils have offsets that need to be fixed. PSMFC has already wrapped these, so we will need to coordinate this work with them. The outfall leak has not been successfully repaired. Contractors are now looking at extending the HDPE pipe to beyond the concrete. NMFS wants to inspect this work when it is complete. The final water-up test for the facility should occur sometime in January.
2. Bonneville 2 DSM – Follow on contract items include: 1.) modify AWS to make it fish free; 2.) investigate cause of distorted orifice flow; 3.) replace orifice valve operators; 4.) modifying orifice size – current orifices provide too much water. NMFS asked that they be involved in the follow-on meetings. Two issues they would like addressed are to provide individual operation at each orifice (to back-flush) and to fill in the shelf along the south end of the west DSM wall. **Dennis will set up a meeting to include NMFS in follow-on discussions (4 January at 0900).**
3. Bonneville Dam Powerhouse 1 Rehab – Unit 4 had its mechanical roll on 6 December. The 72-hour test starts 16 December, and the 100-day test follows. Unit 10 will be on-line May 1, 2000. Unit 3 will be the next for rehab; no date is set, but it will go off-line sometime after Unit 10 comes back.
4. Adult Salmon Studies – We held an SRWG on 1 December to discuss two revised adult salmon proposals. These two proposals were for studies entitled *Evaluation of migrational delays on the reproductive success of adult hatchery spring chinook salmon In the Columbia and Snake Rivers* and *Evaluation of energy expenditure in adult salmon migrating upstream in the Columbia and Snake rivers: understanding the influence of delay, fallback, water temperature, and dam operations on fish performance*. Attendees at the special SRWG gave the proposals a medium ranking. If we determine that FY00 funding is adequate, we will move out on these two studies.
5. Adult PIT – The BPA and Corps met in November with contractors. We have two underwater antennas that will work as detectors in ladder orifices. Work last season by the Fisheries Field Unit suggests there is no effect the orifice detectors on fish behavior. We are moving out on a modeling program that assesses PIT tag antennas on the overflow portion of ladder weirs. The Northwest Hydraulics Model will be ready by the end of March, and we are recommending an agency trip near the end of May. NMFS asked us to look at 26” orifices in BON’s adult lab. They are proposing evaluating two NMFS’ designs, two Destron designs and one hybrid. This would require enlarging 6 orifices to 26”. All flow would go through the orifices under this configuration. The objective would be to evaluate performance of an orifice antenna in a McNary design ladder (26” orifices). Blaine will prepare an outline of the specifics for this request and check with the Fisheries Field Unit to see how this would affect their upcoming evaluation.

## Bonneville

1. Bonneville 1 FGE – Dennis described this year’s proposed evaluations. We will be measuring FGE through direct capture, and with hydroacoustics. We will also monitor near field behavior in front of the B slot trash rack using split-beam hydroacoustics. The objective of this element is to assess whether there would be a benefit to FGE by moving the trashracks upstream.
2. Bonneville 1 JBS Improvements – The Trash Handling FDM is done. The significant change is that the rounded downstream edge of the boom floats are no longer in the design. NMFS said that Washington State used NMFS habitat criteria to change Little Goose Dam float design from concrete to steel pipe. **NMFS will provide us with their habitat criteria and its basis.** Key changes to the JBS plans and specifications include a concrete superstructure for the bridge crossing, and a slide gate at the SEWP/ERC junction.

3. Physical Guidance Device – The report will be finalized. If there are significant changes, we will send it back to the agencies for review.
4. Bonneville 2 High Flow Outfall – We have a contractor working on an outfall design. We are currently looking at model data from the 1:100 and 1:30. We are currently working on the 30% report, which will cover both B1 and B2. After the 30%, the program focus will shift entirely to B2. We plan on conducting biological evaluations at the B2 and TDA sluice chutes this season. The proposals are out for review.
5. Bonneville 2 Debris Study – The modeling work is near completion, and we are scoping the next phase.
6. Bonneville 2 AWS Backup – A 60% report has been completed. The alternatives contained in the report are all expensive, primarily due to fish screening criteria. Rather than taking these expensive alternatives to the 90% level, we retreated to a VE study and generated more alternatives in another of 60% report. These alternatives include: Turbines with a wider operating range, replacing a fish unit with a valve, minimizing down time by keeping spare parts or an additional generator on site.
7. Bonneville Adult Fallback – This program's scope assumed that we would reveal a cause-effect relationship between forebay hydraulics and fallback. We would then develop alternatives that address this relationship. Alternatives would be analyzed and a report would be produced by July 2000. Thus far, we have not found a relationship between project operations and fallback. We had presented this at the last FFDRWG and NMFS had asked us to go back and look for relationships between project operations and fish that fell back within 6 hours of exiting the Bradford Island fishway (as opposed to 24 hours). We have done this. For 1997 and 98 mobile tracking data, 6 fish of the 36 total fallbacks fell back between 6 and 24 hours after exiting the Bradford Island fishway. Removing these fish from the analysis did not change our conclusion that there was no specific project operation in which fish did or did not fall back. Excluding the 6 fish that took longer than 6 hours to fall back in 1997-98, the average time to fall back from last detection at Bradford Island was less than 2 hours. Our next step is to analyze forebay flow patterns. We are doing this with a numerical model and with the 1:100 general model at WES. We will visit the 1:100 general model at WES on the week of December 13 to further analyze forebay hydraulic patterns under various project operations. The numerical model is complete and Battelle is currently running simulations that will describe forebay flow patterns experienced by fish that we mobile tracked in 1997-98. **We will hold an agency meeting on January 6 in which Battelle will present their simulations and we will discuss alternatives.**

#### **John Day:**

1. JDA Spill End Bay Deflectors:
2. John Day Evaluation Paper – A draft paper is due by the end of December. Once this paper is out, we will schedule a meeting to discuss.
3. JDA North Shore Ladder – NMFS added this topic to the agenda. The pointed out that, despite attempts at fixing this problem, we still can only get 3 of the 6 pumps to run. What is needed is a comprehensive investigation of what would be required to meet FPP criteria (e.g. 8' entrance depth, 1-2' head). NMFS will bring the issue to SCT and see if there is money to start something this FY or in FY01.

#### **The Dalles:**

1. TDA Adult Ladder Modifications – The price for this program has gone up to 16 million dollars. We need to reassess this program to ensure it is what we want to do. Further discussion needed.
2. TDA Combined System – We have been proceeding with our modeling program. The dewatering facility, approach channel, and two 4-meter wide channels all looked good. The flip gate at the outfall looked good as well. Our next trip will work to define a range of flip angles

required for different operational conditions. The contractor has questioned the outfall cantilever, but have an idea of how they can cantilever 15 ft. We looked at operating more gates, and it appeared as though we still had acceptable velocities. We will be evaluating a lower sill on sluice entrances in our model program.

3. TDA Survival Test – **We will hold a special SRWG to discuss on 14 January.** See JDA discussion above.

**NEXT MEETING: March 1, 2000, 9:00 a.m., Summit Room, Portland District Corps of Engineers.**